



HV Series Meter

Analog Panel Meters

Technical Data Sheet

HV-212, HV-312 & HV-412 Series Analog Panel Meter





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Application

The HV series of analog panel meters offers accurate measurement and indication of most electrical and electronic parameters in industry standard case sizes.

Available models

HV-212 (Size 2^{1/2}"

HV-312 (Size 3^{1/2}"

HV-412 (Size 4^{1/2}"

The range offers AC and DC ammeters, voltmeters and frequency meters utilizing a high torque pivot and jewel movement.

AC moving iron meters also provided 1.5% high accuracy true RMS measurement.

Applications :

- Marine
- Switchgear
- Distribution systems
- Control panels
- Embedded generation
- Energy management
- Building management
- Utility power monitoring
- Process control
- Motor monitoring

Features

- Measuring and indication of AC amps, volts, frequency & DC signals.
- Panel mounting.
- High torque pivot and jewel movement.
- True RMS measurement meters.
- AC and DC inputs.
- Up to 50A DC direct connected.
- Up to 50A AC direct connected.

Benefits

- Moving iron and moving coil mechanisms.
- ANSI standard case sizes.
- Easy to modify for distributions.

Compliant With

- ANSI C39.1

Application Standard

Scale and pointer for electrical measuring instruments.	ANSI C39.1
Terminal bolts	Ø1/4 UNC -28
Safety requirements and protective measures for Electrical indicating instruments and their accessories.	IEC 61010-1 DIN 40050 / 8-70 VDE 0110 /11-72 VDE 0410 /10-76
Ingress Protection	IP50
Performance specifications for direct acting indicating analogue electrical measuring instruments & their accessories	ANSI C39.1 IEC 60051
UL Combustibility class.	UL 94 V-O
Comply with following European directives (EMC directive), 2006/95/EC (low voltage directive) & amendment 93 / 68 / EEC, for CE Marking.	2004 / 108 / EC

Operation

Moving Coil Meter

These meters offer a center cored, self shielding moving coil movement using pivots, hairsprings and sprung jewels. Variations in movement are limited by design. All DC voltmeters are 1000 ohms per volt, moving coil rectified products run at 900 ohms per volt. Millivolt meters use the 5 milliamps/50mV resistance.

Moving Iron Meter

This clapper type repulsion design utilizes a pivot, hairspring and jewel movement. The bottom jewel is oil filled to provide damping while the top is sprung for resilience. All voltmeters are manufactured with internal voltage dropper resistors.

Frequency Meter

Frequency meters use a 1mA/36 ohm movement driven by an EMC hard frequency conversion circuit.

Dials, Pointers and Scales

Standard dials are matte white black printed scales and a tubular knife-edge black pointer are balanced within 1% of scale length and feature a highly repeatable flattened are scale shape, ensuring accurate measurement reading.

Options for non standard customer specific dials are available upon request.



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Specification

Accuracy	
DC Ammeters and Voltmeters	1.5% 0 to100% of full scale deflection
AC Ammeters and Voltmeters	Moving Iron: 1.5% 10 to100% of full scale deflection
Frequency Meters	0.5% of end scale value
Input Ratings	
DC Moving Coil Ammeters	50uA to 50A
DC Moving Coil Voltmeters	50 mV to 600V
AC Moving Iron Ammeters (EQ)	100mA to 50A
AC Moving Iron Voltmeters (EQ)	6V to 600V
Frequency meters	45-50-55Hz, 55-60-65Hz, 45-55-65Hz
Overload	
Voltmeters	2 times for 0.5 sec : 9 overloads 2 times for 5 sec : 1 overload
Ammeters	10 times for 0.5 sec : 9 overloads
DC Center Zero Voltmeter	10 times for 5 sec : 1 overload
Enclosure	
Movement	High torque pivot and jewel moving coil and moving iron
Scale Balance	Within 1% of scale length
Relative Humidity	25% to 80% nominal range of use
Operating Temperature	0° C to +40° C
Storage Temperature	-20° C to +55° C
Enclosure Code	IP42
Case and Cover	Matt black case UL94V. Polycarbonate cover
Bezel Window	Shatterproof polycarbonate
Fixing	Surface mounting: 4 corner studs, 4-40 UNC (HV-212 & HV-312) for HV-412, 6-32 UNC
Terminals	011-#8-32 UNC 012-1/4"-28 UNC
Compliant With	
Performance	ANSI C39.1 and IEC 51
Manufacture	UL61010 - B
Scaling	ANSI C39.1
Safety	IEC61010-1 (LVD) and BS EN 61326:(EMC) UL 61010
Vibration	ANSI C39.1 cl. 5.13



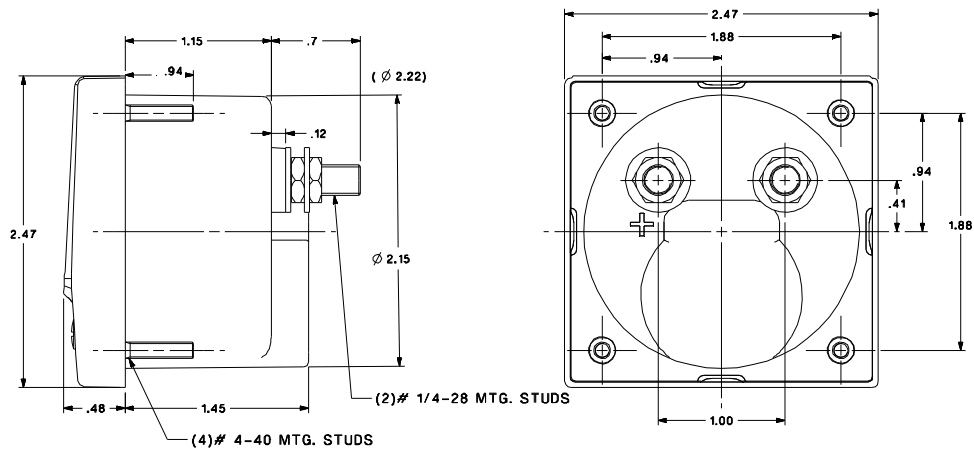
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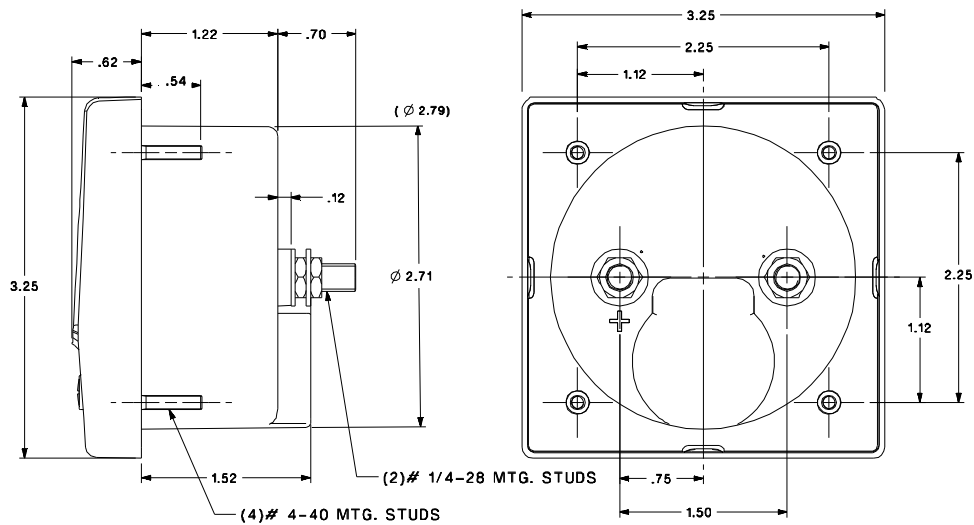
HV-212, HV-312 & HV-412 Series

Dimension Details

HV-212 Analog Panel Meter size 2-1/2"



HV-312 Analog Panel Meter size 3-1/2"



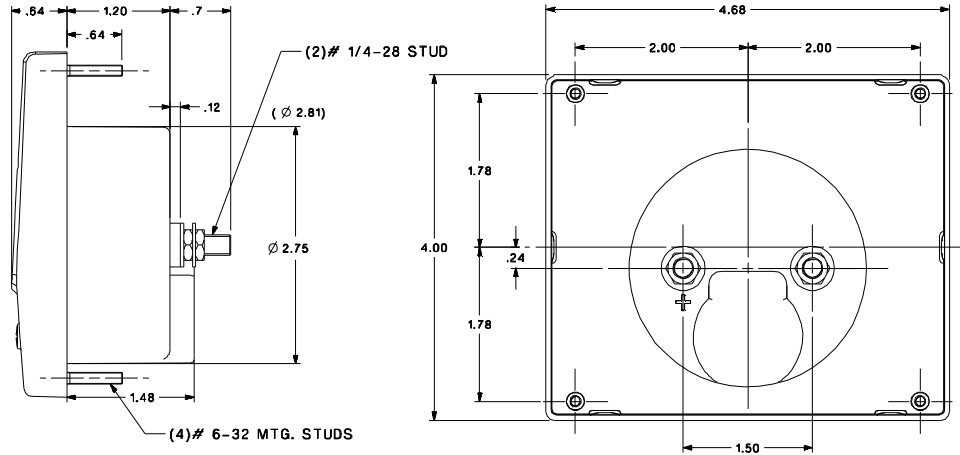


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HV-412 Analog Panel Meter size 4 -1/2"



Note: All dimension are in inches.

Ordering Information- Only For Representative Products

HV-212 AC Voltmeter

Part No.	Range,Scale	Class
HV-212-60VAC-60VAC	212, 60V AC	CL-1.5
HV-212-150VAC-150VAC	212, 150V AC	CL-1.5
HV-212-300VAC-300VAC	212, 300V AC	CL-1.5
HV-212-500VAC-500VAC	212, 500V AC	CL-1.5

HV-212 DC Voltmeter

Part No.	Description	Class
HV-212-10VDC-10VDC	212, 10V DC	CL-1.5
HV-212-15VDC-15VDC	212, 15V DC	CL-1.5
HV-212-30VDC-30VDC	212, 30V DC	CL-1.5
HV-212-50VDC-50VDC	212, 50V DC	CL-1.5

HV-212 Frequency Meter

Part No.	Description
HV-212-HZ-45-65HZ-1	45-55-65 Hz, 120V
HV-212-HZ-45-65HZ-4	45-55-65 Hz, 480V

HV-212 AC Ammeter

Part No.	Description	Class
HV-212-5AAC-5AAC	212, 5A AC	CL-1.5
HV-212-10AAC-10AAC	212, 10A AC	CL-1.5
HV-212-15AAC-15AAC	212, 15A AC	CL-1.5
HV-212-25AAC-25AAC	212, 25A AC	CL-1.5

HV-212 DC Ammeter

Part No.	Description	Class
HV-212-1MADC-1MADC	212, 1mA DC	CL-1.5
HV-212-4-20MADC-4-20MADC	212, 4-20mA DC	CL-1.5
HV-212-10ADC-10ADC	212, 10A DC	CL-1.5

Part No.	Description
HV-212-HZ-55-65-1	55-60-65 Hz, 120V
HV-212-HZ-55-65-4	55-60-65 Hz, 480V



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HV-312 AC Voltmeter

Part No.	Description	Class
HV-312-60VAC-60VAC	312, 60V AC	CL-1.5
HV-312-150VAC-150VAC	312, 150V AC	CL-1.5
HV-312-300VAC-300VAC	312, 300V AC	CL-1.5
HV-312-500VAC-500VAC	312, 500V AC	CL-1.5

HV-312 DC Voltmeter

Part No.	Description	Class
HV-312-10VDC-10VDC	312, 10V DC	CL-1.5
HV-312-15VDC-15VDC	312, 15V DC	CL-1.5
HV-312-30VDC-30VDC	312, 30V DC	CL-1.5
HV-312-50VDC-50VDC	312, 50V DC	CL-1.5

HV-312 Frequency Meter

Part No.	Description
HV-312-HZ-45-65-1	45-55-65 Hz, 120V
HV-312-HZ-45-65-4	45-55-65 Hz, 480V

HV-412 AC Voltmeter

Part No.	Description	Class
HV-412-60VAC-60VAC	412, 60V AC	CL-1.5
HV-412-150VAC-150VAC	412, 150V AC	CL-1.5
HV-412-300VAC-300VAC	412, 300V AC	CL-1.5
HV-412-500VAC-500VAC	412, 500V AC	CL-1.5

HV-412 DC Voltmeter

Part No.	Description	Class
HV-412-10VDC-10VDC	412, 10V DC	CL-1.5
HV-412-15VDC-15VDC	412, 15V DC	CL-1.5
HV-412-30VDC-30VDC	412, 30V DC	CL-1.5
HV-412-50VDC-50VDC	412, 50V DC	CL-1.5

HV-412 Frequency

Part No.	Description
HV-412-HZ-45-65-1	45-55-65 Hz, 120V
HV-412-HZ-45-65-4	45-55-65 Hz, 480V

HV-312 AC Ammeter

Part No.	Description	Class
HV-312-5AAC-5AAC	312, 5A AC	CL-1.5
HV-312-10AAC-10AAC	312, 10A AC	CL-1.5
HV-312-15AAC-15AAC	312, 15A AC	CL-1.5
HV-312-25AAC-25AAC	312, 25 A AC	CL-1.5

HV-312 DC Ammeter

Part No.	Description	Class
HV-312-1MADC-1MADC	312, 1mA DC	CL-1.5
HV-312-4-20MADC-4-20MADC	312, 4-20mA DC	CL-1.5
HV-312-10ADC-10ADC	312, 10A DC	CL-1.5

Part No.	Description
HV-312-HZ-55-65-1	55-60-65 Hz, 120V
HV-312-HZ-55-65-4	55-60-65 Hz, 480V

HV-412 AC Ammeter

Part No.	Description	Class
HV-412-5AAC-5AAC	412, 5A AC	CL-1.5
HV-412-10AAC-10AAC	412, 10A AC	CL-1.5
HV-412-15AAC-15AAC	412, 15A AC	CL-1.5
HV-412-25AAC-25AAC	412, 25A AC	CL-1.5

HV-412 DC Ammeter

Part No.	Description	Class
HV-412-1MADC-1MADC	412, 1mA DC	CL-1.5
HV-412-4-20MADC-4-20MADC	412, 4-20mA DC	CL-1.5
HV-412-10ADC-10ADC	412, 10A DC	CL-1.5

Part No.	Description
HV-412-HZ-55-65-1	55-60-65 Hz, 120V
HV-412-HZ-55-65-4	55-60-65 Hz, 480V